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Research Article

Strategic Agility as a Driver of SME Performance: The Moderating Role of SME's Clusters in Indonesia

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Abstract

Strategic agility is a major focus for small and medium-sized enterprises (SMEs) when facing rapidly changing market uncertainties. This study aims to analyze the influence of strategic agility on the performance of SMEs in Indonesia moderated by SME clusters. This study uses a quantitative approach with a survey of SME owners or managers who were sampled with 277 respondents. The data is analyzed using Structural Equation Modeling (SEM-PLS). The study shows that strategic agility has a positive effect on the performance of SMEs, and SME clusters have an effect on strategic agility on the performance of SMEs. This study provides practical implications for SME actors to improve their sensing agility, decision-making agility, and acting agility. Further research is recommended to include moderation or mediation variables such as innovation or environmental uncertainty to enrich the results.

Keywords: strategic agility, SME's performance, sensing agility, decision making agility, acting agility

INTRODUCTION

Strategic agility is an important resource for small and medium enterprises (SMEs) to create competitive advantage (Guo & Cao's, 2013; Vrontis et al., 2023). SMEs are an important factor for the Indonesian economy. However, the current era of globalization requires SMEs to be able to maintain their existence when there is a change in the business environment. Changes in the business environment can be shown through changes in technology, consumer preferences, and the intensity of competition. Changes in the business environment require SMEs to deal with them

quickly and precisely, which is known as strategic agility (AlTaweel & Al-Hawary, 2021).

Strategic agility shows the strategy of SMEs in responding to changes in the business environment quickly and precisely through sensing agility, decision making agility and acting agility. SMEs that have high sensing agility show that SMEs have good future planning, so they are able to improve SME's performance (Lungu, 2020; Pereira et al., 2021; Vrontis et al., 2023). Likewise, when SMEs have a high ability to respond to changes in the business environment by making appropriate decisions (decision making agility) can improve SME's performance (Ludviga & Kalvina, 2023). SMEs that have a high ability in reconfiguring less efficient SME strategies (acting agility) are able to increase productivity so that SME's performance increases (Soltaninezhad et al., 2021).

This is in line with the Resources Based View (RBV) theory which explains that companies that have unique resources that are not easily imitated by competitors can be demonstrated through strategic agility to be nimble and flexible in responding to market dynamism so that they are able to create a competitive advantage (Widjajani & Nurjaman, 2020). Based on this RBV theory, SMEs have strategic agility to increase their productivity so that SME's performance increases. Theoretically, strategic agility should encourage performance improvement because it allows organizations to learn faster, change strategies flexibly, and adapt to uncertainty. However, other research shows that strategic agility has no effect on SME's performance (Reed, 2021; Tufan & Mert, 2023).

The results of the research that are not consistent between the influence of strategic agility on SME's performance, because there are other factors that affect SME's performance. Based on the contingency theory that states that there is no best management style to achieve SME's performance depending on the characteristics of the organization (Tosi & Slocum, 1984). Organizational characteristics can be shown through SME's cluster. SME's cluster is a group of suppliers, distributors that are located close to each other and operate in the same sector or industry, so they interact with each other, share resources, and strengthen each other (Russo, 2020). SME's cluster is able to facilitate the flow of resources, knowledge and market access so as to be able to improve SME's performance (Falebita et al., 2024; Humphrey & Schmitz, 2010).

This condition increases the ability of agile SMEs to respond to changes, innovate, and take advantage of market opportunities, thus strengthening the influence of strategic agility on SME's performance. SMEs that are in the cluster have access to information and resources so that the effectiveness of strategic agility becomes higher. Thus, SME's cluster acts as a moderating variable that strengthens the relationship between strategic agility and SME's performance. Similar research was also conducted by (Yildiz & Aykanat, 2021) who found evidence that organizational innovation is able to strengthen the influence of strategic agility and firm performance. Other research also found evidence that environmental

uncertainty moderates the influence of strategic agility on performance (Ahammad et al., 2021).

The main contribution of this research is to raise a new research model by including SME's Cluster as a moderating effect of strategic agility on SME's performance. The practical implication for SMEs is to strengthen the ability of sensing agility, decision making agility and acting agility as well as paying attention to Cluster SME's in improving SME's performance**.**

METHODS

Identification of Research Variables

This research consists of endogenous construct ie SME performance, exogenous construct ie strategic agility and moderation construct ie SME's cluster. The following table presents the measurement of constructs and variables:

Table 1. Construct Measurement

No	Construct	Dimensions		Indicators	Source
1	Construct Exogenous: Strategic agility	SA1	SA1_1	SMEs respond quickly to changes in production costs	(Al Taweel & Al-Hawary, 2021)
			SA1_2	SMEs implement future business planning	
			SA1_3	SMEs develop various products	
			SA1_4	SMEs regularly monitor changes in customer needs	
		SA2	SA2_1	SMEs change suppliers when there is a change in production costs	
			SA2_2	SMEs adjust their products when production costs change	
			SA2_3	SMEs produce products without paying attention to production costs	
			SA2_4	SMEs choose new suppliers when production costs change	
			SA3_1	SMEs customize products according to customer needs	
			SA3_2	SMEs adopt new technologies to reduce operational costs	
			SA3_3	SMEs are able to find innovative solutions in the face of market changes	
			SA3_4	SMEs produce products without paying attention to the needs of customers	

No	Construct	Dimensions		Indicators	Source
2	Endogenous Construct: SME's performance	SP1	SP1_1	The sales turnover of SMEs has increased in the last three years	(Hwangbo et al., 2022; Tjahjadi et al., 2022)
			SP1_2	The sales turnover of SMEs can cover the cost of purchasing	
			SP1_3	Total benefits in line with UKM's expectations	
			SP1_4	SME profits have increased in the last three years	
			SP1_5	SME sells quality products at affordable prices	
			SP1_6	SME profits have declined in the last three years	
		SP2	SP2_1	Customer complaints tend to decrease	
			SP2_2	SMEs have loyal customers because of their good reputation	
			SP2_3	SMEs successfully improve the quality of products and services	
			SP2_4	SMEs managed to get new customers	
			SP2_5	SMEs managed to retain existing customers	
			SP2_6	Customer complaints tend to increase	
3	Moderation Construct: SME's cluster			The SME group consists of: 1. Food & Beverage, 2. Tourism, 3. Bags, 4. Metal, 5. Handicraft, 6. Convection, 7. Agriculture, 8. Gebyok, 9. Others	(Dinas Tenaga Kerja Perindustrian Koperasi Usaha Kecil dan Menengah, 2023)

Source: Edited by Author, 2025

Research Subject

Population and Sample

The population in this research is small and medium businesses in Kudus Regency. The sampling technique in this study uses the Slovin formula with an alpha of 5%. The population in this study was 892. Based on the Slovin formula, a sample of 277 was obtained.

Data collection technique

The data collection technique is done by distributing questionnaires to respondents. Respondents who fill out this questionnaire are SMEs in Kudus Regency based on SME clusters (Dinas Tenaga Kerja Perindustrian Koperasi Usaha Kecil dan Menengah, 2023).

Data analysis

The data analysis technique in this research is the quantitative analysis technique of the structural equation modeling-partial least square (PLS-SEM) method with smart PLS version 4. The data is analyzed using the second order construct reflective-reflective model. This data testing is done in stages: outer model testing (validity and reliability), inner model testing and model fit testing.

RESULT AND DISSCUSSION

Descriptive statistics

Descriptive statistics show that all indicators on the construct of Strategic Agility and SME's Performance have an average value in the range of 3.5-4.4, which indicates that respondents tend to agree with all the statements presented. The minimum value of each item is 1, while the maximum value reaches 5, so that all variables have a full scale range. Meanwhile, the standard deviation value ranges between 0.57-1.00, indicating that there is a relatively moderate variation of answers between respondents. The following is a descriptive statistical table:

Table 2. Descriptive Statistics

Construct	Dimensions		N	Minimum	Maximum	Mean	Std. Deviation
Strategic Agility	SA1	SA1_1	277	1.00	5.00	4.1300	0.71048
		SA1_2	277	1.00	5.00	4.2347	0.71664
		SA1_3	277	2.00	5.00	4.1805	0.73960
		SA1_4	277	2.00	5.00	4.1119	0.60652
	SA2	SA2_1	277	1.00	5.00	3.5126	0.99493
		SA2_2	277	2.00	5.00	3.9892	0.75414
		SA2_3	277	2.00	5.00	4.1408	0.65250
		SA2_4	277	1.00	5.00	3.5126	0.95022
	SA3	SA3_1	277	1.00	5.00	4.1733	0.77945
		SA3_2	277	2.00	5.00	4.0325	0.71401
		SA3_3	277	2.00	5.00	4.1769	0.67655
		SA3_4	277	3.00	5.00	4.2274	0.65017
SME's Performance	SP1	SP1_1	277	1.00	5.00	3.7581	0.89846
		SP1_2	277	1.00	5.00	3.9639	0.79318
		SP1_3	277	2.00	5.00	3.8809	0.79187
		SP1_4	277	2.00	5.00	3.7690	0.82798
		SP1_5	277	2.00	5.00	4.0505	0.61765
		SP1_6	277	2.00	5.00	3.9892	0.68357
	SP2	SP2_1	277	2.00	5.00	4.1841	0.54377
		SP2_2	277	2.00	5.00	4.3466	0.65588

SP2_3	277	2.00	5.00	4.2780	0.62437
SP2_4	277	1.00	5.00	4.2960	0.63052
SP2_5	277	3.00	5.00	4.3069	0.58643
SP2_6	277	3.00	5.00	4.2527	0.57832

Source: Edited by Author, 2025

The distribution of the SME cluster shows that most of the respondents come from the other cluster (27.1%), followed by Food & Beverage (26.7%) and Convection (17.3%). Meanwhile, the cluster with the smallest proportion is Bag (2.2%) and Agriculture (2.9%). This finding shows that the research sample covers various business sectors with dominance in the culinary sector, convection, and other categories. Below is presented the frequency of SME's cluster:

Table 3. Frequency of SME Clusters

SME's Cluster	Frequency	Percent
1,00	74	26,7
2,00	17	6,1
3,00	6	2,2
4,00	15	5,4
5,00	22	7,9
6,00	48	17,3
7,00	8	2,9
8,00	12	4,3
9,00	75	27,1
Total	277	100,0

Source: Edited by Author, 2025

Test Common Method Bias

The results of the Common Method Bias test using Harman's Single Factor Test show that the first factor only explains 33.995% of the total variation before extraction and 31.324% after extraction. This value is well below the 50% threshold (Kock, 2021), So it can be concluded that there is no significant Common Method Bias issue in the research data. The following table presents common method bias:

Table 4. Common Method Bias Test

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8,159	33,995	33,995	7,518	31,324	31,324

Source: Edited by Author, 2025

Validity and Reliability

The results of the outer model evaluation show that all indicators in the Strategic Agility and SME's Performance constructs have outer loading values ranging from 0.681 to 0.893. The majority of indicators have met the criteria of >0.70, which

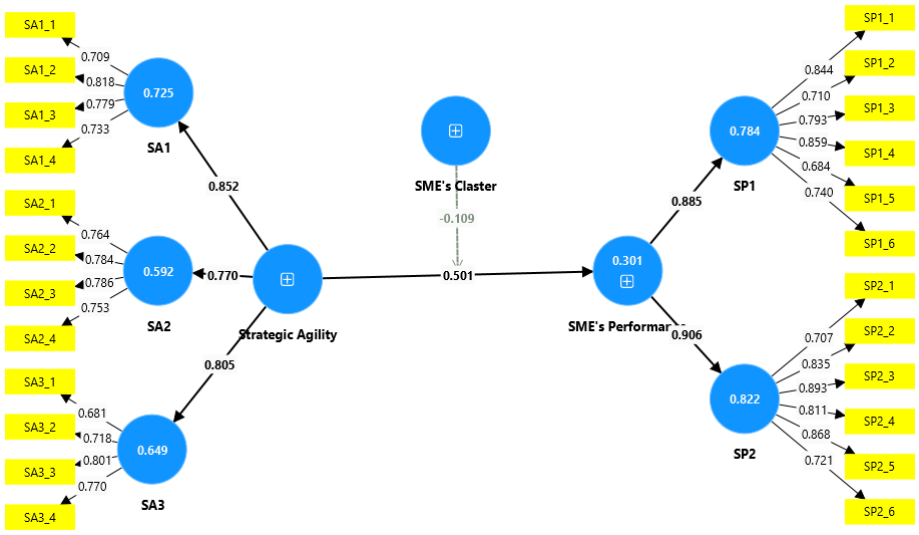
according to Hair et al (2021) shows good convergent validity. Several indicators that have loading values slightly below 0.70 (for example SA3.1 = 0.681) are retained because they still meet the minimum limit of 0.60, as permitted by Hair et al (Hair et al., 2021) If the AVE and construct reliability have been met. The Average Variance Extracted (AVE) values for all constructs are above the 0.50 threshold (Strategic Agility: 0.553–0.596; SME's Performance: 0.600–0.654), indicating that more than half of the indicator variance can be explained by the latent construct. This meets the convergent validity criteria. (Hair et al., 2021). In terms of reliability, the Cronbach's Alpha, Rho_a, and Composite Reliability (Rho_c) values for all constructs were above 0.70, with many exceeding 0.80, confirming that the instrument has strong internal reliability. Thus, based on the PLS-SEM guidelines, Hair et al (Hair et al., 2021), All constructs in this model are valid and reliable, so the analysis can proceed to the inner model. The following are the results of the outer model testing:

Table 5. Outer Model

Construct			Outer Loading	AVE	Cronbach Alpha	Rho_a	Rho_c
Strategic Agility	SA1	SA1_1	0.709	0.579	0.757	0.761	0.846
		SA1_2	0.818				
		SA1_3	0.779				
		SA1_4	0.733				
	SA2	SA2_1	0.764	0.596	0.776	0.781	0.855
		SA2_2	0.784				
		SA2_3	0.786				
		SA2_4	0.753				
	SA3	SA3_1	0.681	0.553	0.729	0.731	0.832
		SA3_2	0.718				
		SA3_3	0.801				
		SA3_4	0.770				
SME's Performance	SP1	SP1_1	0.844	0.600	0.864	0.869	0.899
		SP1_2	0.710				
		SP1_3	0.793				
		SP1_4	0.748				
		SP1_5	0.684				
		SP1_6	0.740				
	SP2	SP2_1	0.707	0.654	0.892	0.897	0.919
		SP2_2	0.835				
		SP2_3	0.893				
		SP2_4	0.811				
		SP2_5	0.868				
		SP2_6	0.721				

Source: Edited by Author, 2025

Figure 1 below shows the results of the outer model test which has been fulfilled.



Source: Edited by Author, 2025

Figure 1. Outer Loading Results

Inner Model

Based on the estimation results in Table 8, the original sample value for the influence of strategic agility on SME performance is 0.501, with a p-value of 0.000. The positive and significant coefficient value ($p < 0.05$) indicates that strategic agility has a positive and significant influence on SME performance. The first hypothesis is accepted. These results indicate that the higher the ability of SMEs to sense market changes, reconfigure resources, and respond to changes (dimensions SA1, SA2, SA3), the better the business performance. In other words, agile SMEs are able to increase their productivity, efficiency, and competitive advantage.

For the moderation effect, the interaction of SME's cluster x strategic agility on SME's performance has an original sample value of -0.109 with a p-value of 0.041. Because the p-value <0.05, the moderating effect is declared significant, even though the direction of the coefficient is negative. These results indicate that SME clusters moderate the relationship between strategic agility and SME performance, but the moderation is weakening (negative moderation). The second hypothesis is accepted, but the moderation pattern is negative moderation. The following are the results of the hypothesis testing:

Table 6. Hypothesis Testing Results

	Original sample (O)	Sample mean (M)	P values
SME's Cluster -> SME's Performance	-0.123	-0.125	0.012
SME's Performance -> SP1	0.885	0.886	0.000
SME's Performance -> SP2	0.906	0.907	0.000
Strategic Agility -> SA1	0.852	0.852	0.000

Strategic Agility -> SA2	0.770	0.769	0.000
Strategic Agility -> SA3	0.805	0.808	0.000
Strategic Agility -> SME's Performance	0.501	0.502	0.000
SME's Cluster x Strategic Agility -> SME's Performance	-0.109	-0.108	0.041

Source: Edited by Author, 2025

Model Fit

The results of the model fit test are seen from the R^2 and Q^2predict values (Hair et al., 2019). The R^2 value indicates the model's in-sample predictive ability, while Q^2predict describes the model's out-of-sample predictive relevance. Based on Table 9, the reflective variables in the strategic agility construct (SA1, SA2, SA3) have quite high R^2 values, namely 0.725, 0.592, and 0.649, indicating that the model is able to explain between 59.2% and 72.5% of the variation in strategic agility indicators. Furthermore, the SME's Performance construct shows an R^2 value of 0.301, which means the model is able to explain 30.1% of the variation in SME's performance. This value is included in the moderate category for social research (Hair et al., 2019).

The Q^2predict values for all constructs were also above 0, ranging from 0.227 to 0.721, indicating good predictive relevance for the model. Specifically, the high Q^2predict value for the strategic agility indicator (0.589–0.721) indicates the model's strong predictive ability for that construct. Meanwhile, the Q^2predict value for SME's Performance (0.286) was also in the moderate category, indicating the model's adequate out-of-sample predictive ability.

Thus, based on the R^2 and Q^2predict values, it can be concluded that this research model has good model fit and adequate predictive relevance, making it suitable for further hypothesis testing. The following table presents the R^2 and Q^2predict values:

Table 7. R^2 and Q^2predict

	R^2	**Q^2predict**
SA1	0.725	0.721
SA2	0.592	0.589
SA3	0.649	0.642
SME's Performance	0.301	0.286
SP1	0.784	0.227
SP2	0.822	0.231

Source: Edited by Author, 2025

Discussion

Strategic agility dan SME's Performance

Test results show that strategic agility has a positive effect on SME performance. The test results indicate that the more agile SMEs are in facing changes in the business environment, the higher their performance will be. SMEs with high strategic agility are able to respond quickly to changes in production costs, adjust products when production costs change, and adapt products to customer desires, thereby increasing sales, which ultimately improves firm performance. These test

results support research conducted by (Adomako et al., 2022; Ahammad et al., 2021; AlTaweel & Al-Hawary, 2021; Chan & Muthuveloo, 2022; Clauss et al., 2021; Dahleez & Abdelfattah, 2022) which states that strategic agility contributes to improving firm performance.

The results of this test support the RBV theory. RBV theory asserts that a business's success can be determined by unique resources that can enhance the company's competitive advantage. (Özgül & Zehir, 2023). The unique resources of SMEs that can enhance a company's competitive advantage can be demonstrated through the company's ability to face uncertain business conditions (strategic agility) and thus be able to adapt to environmental changes. SMEs with high strategic agility demonstrate a high level of innovation in business, thereby improving firm performance. The increasingly rapid changes in the business environment make strategic agility a key capability for companies to remain competitive, be able to face unexpected disruptions, and be able to seek new opportunities, thus improving SME performance (Haddad & Hassan, 2025).

Research data shows that 60% of SMEs that demonstrate strategic agility by responding quickly to changes in the business environment are able to improve firm performance. This demonstrates that 61% of SMEs are capable of achieving high firm performance. Overall, strategic agility among SMEs in Kudus Regency has a positive effect on firm performance. These test results align with the findings of the study Kafetzopoulos et al. (Kafetzopoulos et al., 2022) that strategic agility can improve firm performance. However, the results of this study do not support research conducted by (Reed, 2021; Tufan & Mert, 2023) which states that strategic agility does not influence firm performance.

SME's Cluster, Strategic Agility and SME's Performance

The analysis results show that SME's Cluster acts as a significant moderating variable in the relationship between strategic agility and SME's performance (β_interaction = −0.109; p = 0.041). The negative interaction coefficient indicates that differences in SME cluster types including food & beverage, tourism, bags, metal, handicrafts, convection, agriculture, gebyok, and others actually weaken the positive influence of strategic agility on SME performance.

The results of the study indicate that the presence of SME clusters actually weakens the influence of strategic agility on SME performance. This finding indicates that cluster dynamics do not always produce a moderating effect that strengthens the hypothesized relationship. Instead, several conditions can make clusters a source of external rigidity that hinders the effectiveness of strategic agility. First, naturally formed clusters without strong institutional coordination often create interdependence between actors, leading companies to rely more on established traditional production patterns rather than making strategic changes. Dependence on local suppliers, routine distribution patterns, and homogeneous business practices can reduce a company's incentive to be agile, as strategic changes can conflict with established cluster practices. Second, immature SME clusters often face high internal

competition, with many actors offering similar products. This condition can shift a company's focus from agility to short-term survival, resulting in suboptimal sensing or seizing capabilities. Pricing pressures within the cluster also often reduce a company's capacity to invest in innovations that support agility.

As a result, strategic agility, which should improve performance, does not function optimally in cluster environments that are rigid, fragmented, or have weak governance. Thus, clusters act as negative moderators, weakening the influence of strategic agility on MSME performance.

These findings indicate that the effectiveness of strategic agility is uneven across clusters. In highly dynamic clusters such as food & beverage or tourism, strategic agility tends to significantly improve performance. Conversely, in more stable, craft-based clusters such as metal, gebyok, or handicrafts, agility does not always provide the same benefits. Consequently, the greater the cluster variation in the sample, the lower the strength of strategic agility's influence on aggregate performance.

Although strategic agility still improves SME performance, this positive effect is lower when SMEs are located within a specific cluster. This may occur because SMEs within a cluster often have more rigid rules, standards, or structures, thus slightly hampering strategic flexibility. Therefore, it can be concluded that SME clusters function as a negative moderator, where the diversity of business clusters weakens the relationship between strategic agility and SME performance. These test results support contingency theory, which states that strategy effectiveness depends on organizational conditions, namely SME clusters (Tosi & Slocum, 1984). The results of this test support research that has been conducted by Alfarajat (2023) which shows that innovation capability can moderate the relationship between strategic agility and SMEs' performance. Although the focus is not on clusters, this provides modern empirical evidence that innovation capability can act as a moderator in the strategic-performance relationship in SMEs (Ahammad et al., 2021) also supports the research results that environmental uncertainty moderates the influence of strategic agility on performance.

These findings have important implications: the mere existence of clusters does not guarantee improved MSME performance. Ecosystem maturity, coordination between actors, collective innovation, and support from supporting institutions are key factors in enabling clusters to play a role that strengthens, rather than hinders, the effectiveness of strategic agility.

CONCLUSION

The results of this study confirm that strategic agility has a positive effect on SME performance in Kudus Regency. SMEs that are able to respond quickly, flexibly, and adaptively to changes in the business environment have been shown to perform better, particularly in terms of sales, operational efficiency, and customer satisfaction. This finding is consistent with various recent studies (Adomako et al., 2022; Ahammad et al., 2021; Chan & Muthuveloo, 2022; Kafetzopoulos et al., 2022) which

emphasizes the importance of strategic agility in improving business performance. Theoretically, these results support the Resource-Based View (RBV), which states that unique resources such as strategic agility can become a competitive advantage that results in superior performance.

Furthermore, the study found that SME clusters negatively moderate the relationship between strategic agility and SME performance. Differences in characteristics across clusters—for example, demand dynamics, the rate of technological change, or the rigidity of production processes—make the effectiveness of strategic agility inconsistent. In highly dynamic clusters, agility drives performance more strongly; however, in stable and traditional clusters, the impact is weaker. This finding aligns with contingency theory, which emphasizes that strategy effectiveness depends on the organizational context.

CONTRIBUTIONS

Theoretical Contributions

This research strengthens the literature on the role of strategic agility as a strategic resource in the RBV that can improve SME performance. It provides new empirical evidence that SME clusters act as a negative moderator, broadening the understanding of contingencies in the strategic agility-performance relationship. Cluster-based moderation studies are still very limited, so these findings add new insights in the SME context. It supports modern moderation research in the context of agility, such as Alfarajat (2023) and Ahammad et al. (2021), with a different moderation focus, namely clusters, thus enriching the perspective of "fit" between strategy and the operational context of SMEs.

Practical Contributions

Provides evidence that SMEs need to develop rapid response capabilities to change as a key strategy for improving performance. The findings of cluster-based moderation indicate that MSME assistance policies cannot be universal but must be tailored to the dynamics of each cluster. Local governments can design agility-boosting programs for clusters that tend to be rigid, such as metal, gebyok, or handicrafts, to increase operational agility.

Methodological Contributions

This study tests cluster moderation using an interaction approach that is rarely used in SME research in Indonesia, contributing to industry cluster category-based moderation modeling.

Limitations

The number of respondents per cluster differed significantly (e.g., the "other" and food and beverage clusters dominated). This could affect the strength of the moderation and the generalizability of the results. The concept of cluster-based moderation remains categorical. Clusters are categorized solely by business type, without considering the level of environmental dynamics, technology, or competition within each cluster. The research location was limited to Kudus Regency. The cultural

context, business characteristics, and local economic conditions may limit the generalizability of the findings to other regions.

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